

Meeting with Catherine Proccacia

Member of the Parliamentary Office for the evaluation of scientific and technological options and French Senator

In the context of the OPECST report, we organized a lot of hearings, round tables about CRISPR-Cas9 and meetings in London, Berlin, Brazil, Argentina.

By interesting us to biotechnologies we worked on CRISPR-Cas9. The danger with prior techniques was the risk of off-target, it seems that with CRISPR the risk is considerably reduced.

There are 3 domains in which CRISPR has applications: Human, plants and animals.

Human applications

This is the application which creates less discussions due to all the hopes for the public health sector.

Concerning ethical questions, everyone agrees with the Oviedo convention (Convention for the Protection of Human Rights and Dignity of the Human Being with regard to the Application of Biology and Medicine, 1997). But, some parliamentarians try to put prohibition measures. Ecological senator wanted for instance, to write within the law on biodiversity the ban of use of CRISPR-Cas9. The amendment had been rejected.

By working on the report for the law on new biotechnologies, we realized the breadth of the technique. CRISPR-Cas9 allows to work on various disease, such as the Duchenne disease. These diseases are not treated because they are scarce. In the US researches on these illnesses exist, but in France the cost is too expensive. Research is possible within the US because financial support of private groups is easier.

Plants and Animals

These two categories are actually linked. People have the same fears with CRISPR than they used to have with the GMOs. GMOs are different from CRISPR: GMOs are defined as the introduction of a gene while CRISPR not always introduce a gene but sometimes only cut the DNA.

CRISPR can be advantageous: the INRA institute (National Institute for Agriculture and Research, France) managed to create a mildew resistant grape. Vine cultivation is the area which use the most pesticides, using this resistant grape would allow to reduce the use of these chemicals.

CRISPR is not a revolution but an evolution. The technique is the fruit of a long research and several elements already existed. To make a comparison to understand what CRISPR brings to

Science, it is the same difference between a traditional cellphone and a smartphone: a progress!

The commercial application will concern probably more plants and animals than the public health. For instance, in Argentina, they are making test on calves. The idea is to take off the milk protein which is responsible of milk allergy. The commercial interest here is really important.

Environment

Today, there are key challenges and CRISPR can help to solve them. The precautionary principle was a mistake, it needs to have its essential corollary, a principle of innovation. There is a kind of absurdity to absolutely not changing the nature. Everything we see or have in our plate today, has already been reproduced by natural or human mutations.

In Europe, some GMOs are prohibited and now we import products from abroad which come from those same GMOs. We, thus, import treated products while the treatment is prohibited in France.

The only limit to the use of CRISPR comes from the fact that we need to know the DNA sequence of the plant or the animal we want to modify. Some DNA sequences are still not known today.